

Quarterly Surveillance Report

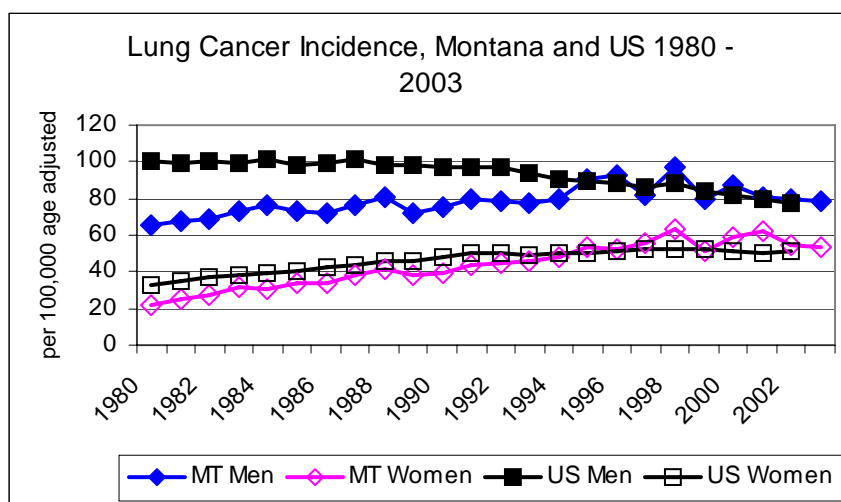
July 2006

Volume 2006, number 3

Lung Cancer in Montana

Lung cancer caused 502 deaths in Montana in 2004. It was responsible for 27% of all cancer deaths. Lung cancer accounts for 14.5% of incident (newly diagnosed) cancers in Montana each year, following prostate cancer for men (19%) and breast cancer for women (15%), but accounts for approximately twice as many cancer deaths each year than either prostate or breast cancer.

In 1980, the incidence of lung cancer among Montana men was substantially lower than that for men in the US as a whole, but since that time the incidence of lung cancer among US men decreased while the incidence among Montana men increased. Incidence among men in Montana is now similar to that of men in the US as a whole. It appears that the increasing trend for Montana men may have peaked in the late 1990s and may possibly be declining. The incidence among women in Montana has closely paralleled the incidence among women in the US. Both showed increasing incidence from 1980 through the mid-1990s. Incidence among women may have stabilized in the late 1990s.



Unlike many cancers, the causes of lung cancer are well known. Approximately 85% of lung cancer is attributable to smoking. The remaining 15% is attributable to exposure to second-hand smoke,¹ environmental radon in the home,² occupational exposures (e.g.,

¹ Hackshaw et al., 1997, *Brit Med J* 7114:980-988.

² National Research Council, 1999, *Health Effects of Exposure to Radon, BEIR VI*, National Academy Press, Washington, DC.

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asbestos, tar and soot, arsenic, chromium, nickel),³ and air pollution.⁴ Lung cancer is one the most preventable of all cancers because the causes are modifiable.

Smoking

People who smoke a pack of cigarettes a day are 10 times more likely to develop lung cancer than non-smokers.³ According to the 2005 Adult Tobacco Survey in Montana, 18% of adults age 18 and older are current smokers and 26% are former smokers. Because the development of cancer is a long-term and multistage process, smoking cessation can substantially reduce the risk of developing lung cancer. It has been estimated that the risk of lung cancer for a former smoker is reduced by half 10 years after cessation.⁵

Second-Hand Smoke

Non-smokers who work in smoking environments or who live with smoking spouses have a 25% increased risk of lung cancer relative to individuals not exposed to second-hand smoke.⁶ Second-hand smoke contains the same carcinogenic compounds as inhaled smoke. Working an eight-hour shift in a smoky bar can be the equivalent of smoking one to two packs of cigarettes a day.⁷ Since the Montana Clean Indoor Air Act went into effect in October 2005, only bar, tavern, and casino workers in those establishments that have requested temporary exceptions remain unprotected from second-hand smoke at work. However, many individuals are exposed to second-hand smoke in private homes, cars, and other non-public places not covered by the law.

Radon

Radon is a naturally occurring gas produced by the decay of uranium in soil and water. Radon emits alpha radiation that can damage the genetic material of lung cells when inhaled. This genetic damage is one step in the multistage process that may lead to the development of lung cancer. The alpha radiation does not penetrate beyond the lung tissues so there are no other known health hazards from radon exposure.

Radon occurs worldwide, although in higher concentrations in some geographic areas than others. A population-based study in Iowa,⁸ ongoing since 1993, has demonstrated convincingly that radon from normal daily exposures can increase the risk of lung cancer in both smokers and non-smokers. Recent meta-analyses of smaller epidemiologic studies

³ Alberg and Samet, 2003, *Chest* 123 (suppl) 21S-49S.

⁴ Veneis et al., 2004, *Int J Cancer* 111:647-652.

⁵ *The Health Benefits of Smoking Cessation*. US DHHS Publ No (CDC) 90-8416, 1990.

⁶ Hackshaw et al., 1997, *Brit Med J* 315:980-988; Woodward and Laugesen, 2006, *Tobacco Control* 10:383-388..

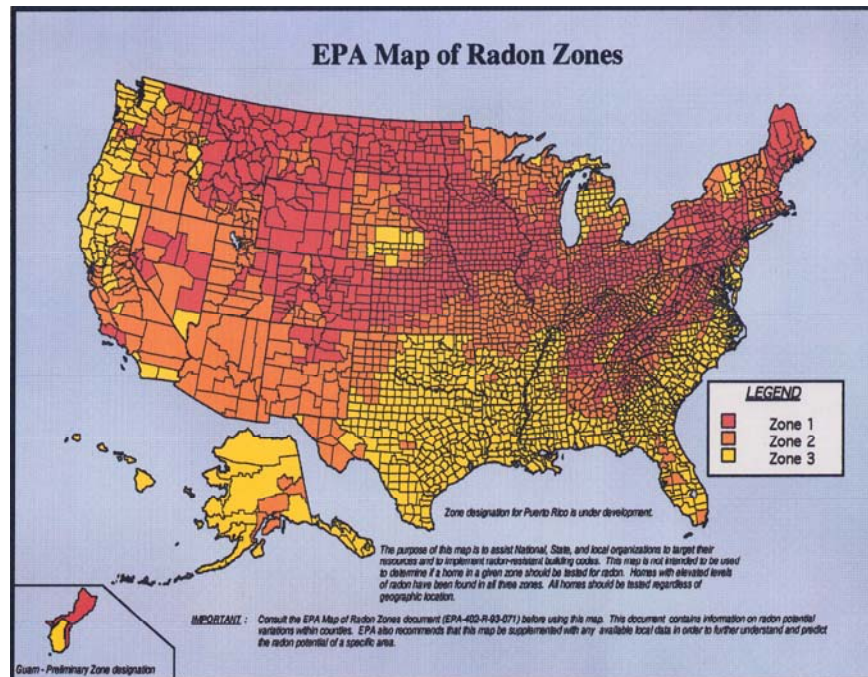
⁷ Siegel and Skeer, 2003, *Tobacco Control* 12:333-338.

⁸ Field et al., 2000, *Am J Epidemiol* 151:1091-1102

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supports this finding.⁹ It is estimated that residential radon exposure is responsible for 10% of lung cancer in the US. It is not clear whether smokers are at an increased (multiplicative) risk from the combination of smoking and radon, or whether radon constitutes an additive risk for smokers.

In the map below, Zone 1 in red has the highest average radon concentration in homes although there are substantial local variations within a given zone.



The US Surgeon General issued the following Health Advisory in 2005: *"Indoor radon is the second leading cause of lung cancer in the US and breathing it over prolonged periods can present a significant health risk to families all over the country. It is important to know that this threat is completely preventable. Radon can be detected with a simple test and fixed through well-established venting techniques."* The US Environmental Protection Agency (EPA) also encourages home testing and provides guidance for families.¹⁰

Montana State University conducted a Radon Study in 1997. It found that 47% of homes in Montana had radon levels above the recommended abatement threshold. The Montana Comprehensive Cancer Control Plan includes recommendations for radon testing and, where necessary, radon abatement for existing homes and new construction throughout the state.¹¹

⁹ Darby et al., 2005, *Brit Med J* 330:223-229; Krewski et al., 2005, *Epidemiology* 16:137-145.

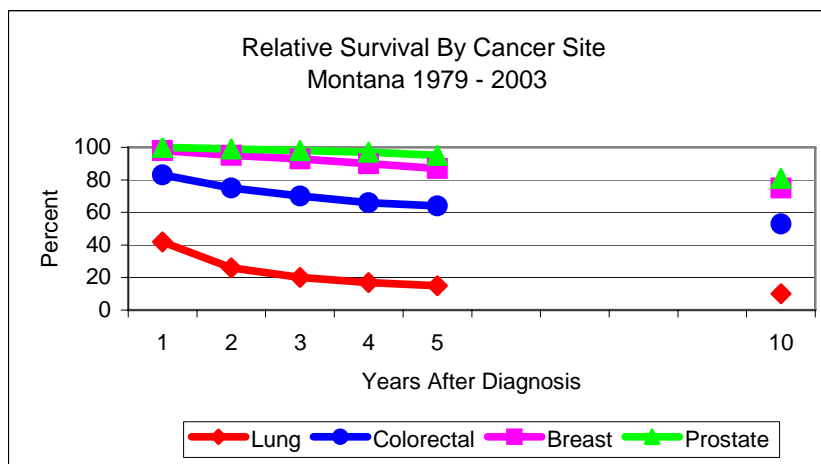
¹⁰ <http://www.epa.gov/radon/pubs/citguide.html>

¹¹ Montana Comprehensive Cancer Control Plan, www.cancer.mt.gov

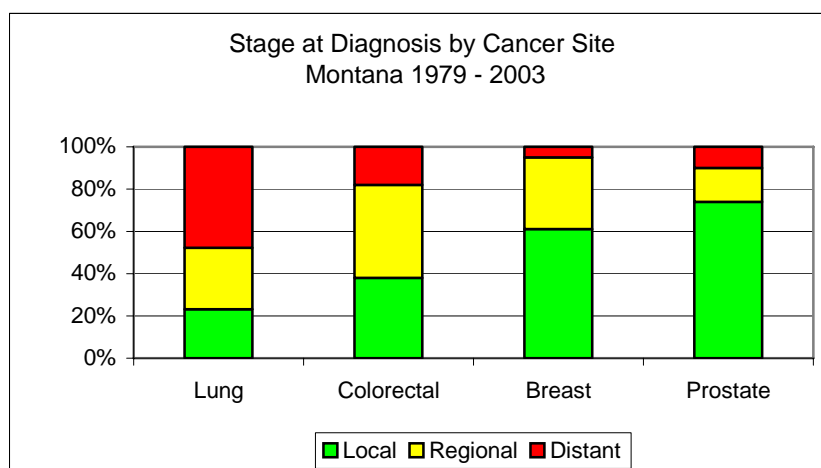
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Reducing Lung Cancer Mortality

Prostate, breast, lung, and colorectal cancers account for 60% of all incident cancers in Montana. Lung cancer has by far the poorest relative survival (adjusted for life expectancy in the population as a whole). Only 40% of patients diagnosed with lung cancer survive one year after diagnosis.



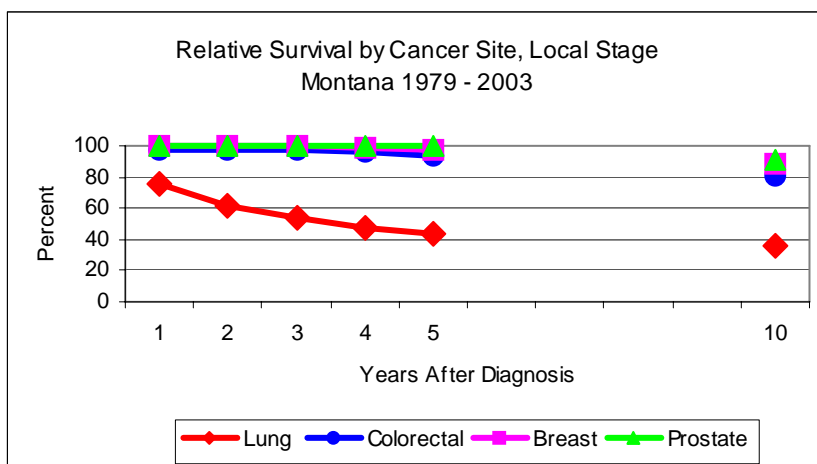
Cancer survival depends strongly on stage at diagnosis. The three other most common cancers are more often diagnosed at a local or regional stage, while lung cancer is most often diagnosed at a distant stage. Late diagnosis does not account for all the difference in survival because even if lung cancer is diagnosed at a local stage, survival is poorer than for the other common sites.



There are no satisfactory screening procedures for early detection of lung cancer. The US Preventive Services Task Force evaluated available screening techniques in 2004. It concluded that "the evidence is insufficient to recommend for or against screening

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asymptomatic persons for lung cancer..."¹² Although some screening techniques can



detect lung cancer at an early stage, the techniques have low specificity (i.e., many false positives). The National Cancer Institute is currently sponsoring a large trial of smokers and former smokers to determine if newer screening technologies may perform better.¹³

The only effective approach to reducing mortality from lung cancer is prevention. Smoking is by far the most important cause of lung cancer, followed by exposure to second-hand smoke and radon. All these exposures can be avoided by individual choice and behavior. In addition, second-hand smoke exposure can be reduced by legislation such as the Montana Clean Indoor Air Act.

The State of Montana Tobacco Use and Prevention Program sponsors the QuitLine. Anyone can call toll-free at 1-866-485-7848. The Quit Line offers free and confidential information, counseling, help kits, and nicotine replacement therapy.

For more information about the Montana Clean Indoor Air Act, please contact the Montana Tobacco Use Prevention Program toll-free at 1- 866-787-5247.

The State of Montana Department of Environmental Quality maintains a toll-free Radon Hotline at 1-800-546-0483. Radon specialists are available to provide more information about testing and abatement.

The Montana office of the American Lung Association offers inexpensive radon test kits; call toll-free 1-800-586-4872.

¹² US Preventive Services Task Force, 2004, <http://www.ahrq.gov/clinic/3rduspstf/lungcancer>

¹³ <http://www.cancer.gov/nlst>

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Please visit our website at www.cancer.mt.gov

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Costs for developing and printing this document were defrayed in part by a cooperative agreement with the Centers for Disease Control and Prevention. 2,500 copies of this public document were produced at an estimated cost of \$0.45 per copy, for a total cost of \$1100.00 for printing and \$0 for distribution.